

Table of Contents

1. Introduction.....	1
1.1 Background	1
1.1.1 Establishment of the ITSG.....	2
1.2 Purpose, Scope and Applicability	3
1.3 Relationship to the JTA and DII COE	4
1.4 Relationship to the DON IM/IT Strategic Plan	4
1.4.1 Network-Centric Environment.....	4
1.4.2 Client/Server Model of Computing	5
1.4.3 Open System Standards	5
1.4.4 Acquisition Improvement	5
1.4.5 Information Process Re-Invention.....	6
1.5 Use of the DON ITSG.....	6
1.6 Document Organization	7
1.7 Promulgation of IT Standards and Guidance.....	8
1.8 Changes to this Document.....	9
1.9 Waiver of ITSG Compliance.....	10
2. Approach to IT Standards Guidance (ITSG).....	11
2.1 Best Practices, Standards, Products and Guidance	12
2.1.1 Open System Standards	12
2.1.2 De Facto Standards.....	14
2.1.3 Product Suite and Products	14
2.1.4 Order of Precedence	14
2.2 Application of Standards and Guidance	14
2.3 Level of Abstraction.....	15
2.4 System Capability	15
2.5 Standards, Architectures and Infrastructure	16
2.5.1 Supporting Infrastructure Evolution	16
2.5.2 Characterizing Information Technology	18
2.5.3 The Logical Environment	22
2.5.4 Area Network Designations	23
2.5.5 The Physical Environment	27
2.5.6 Information System Domains.....	28
2.5.7 System Domain Components and Linkages.....	29
2.6 Platforms, Activities and Operating Environments	30

2.7 Currency of Standards and Guidance.....	33
2.8 Degree of Compliance.....	35
2.9 Standards and Guidance Selection Criteria	35
2.10 Enterprise Standards and Guidance Profiles	36
2.10.1 Profiles.....	36
2.10.2 DOD Technical Reference Model.....	36
2.11 Promulgation of IT Standards and Guidance	37
2.12 References	38
3. Information Protection.....	39
3.1 Overview	39
3.2 Background	39
3.3 Information Protection Requirements	40
3.4 Defense in Depth Approach	42
3.4.1 Zone 4 Protection Mechanisms	44
3.4.2 Zone 3 Information Protection Mechanisms.....	51
3.4.3 Zone 2 Information Protection Mechanisms.....	53
3.4.4 Zone 1 Information Protection Mechanisms.....	54
3.5 Public Key Infrastructure	60
3.6 Use of Commercially Available Cryptography	64
3.6.1 Overview of Cryptography	65
3.6.2 Standards for Symmetric Encryption Algorithms	65
3.6.3 Standards for Public Key Cryptography	67
3.6.4 Standards for Message Digest Algorithms.....	68
3.6.5 Digital Signatures	69
3.7 References	70
4. Facility and Environmental Requirements.....	75
4.1 Overview	75
4.2 Site Security.....	76
4.3 Cable Plant	76
4.3.1 Definitions.....	77
4.3.2 Media.....	78
4.3.3 Patch Panels, Interconnection Boxes and Connectors	80
4.3.4 Connectors	82
4.3.5 Topology, Security & Integrated Cabling.....	85
4.3.6 Cable Security	87
4.3.7 Cable Plant Integration Guidance.....	88
4.3.8 Cable Plant Management	89

4.4 Shipboard Facility Requirements.....	90
4.4.1 Racks	90
4.4.2 Electrical System Interfaces.....	92
4.4.3 Air Conditioning.....	93
4.4.4 Satellite Communication Equipment Requirements.....	93
4.4.5 Special Considerations for Shipboard Mission Critical Signals.....	95
4.5 Shore-based Facility Requirements	96
4.5.1 Architectural Components:	96
4.5.2 Fire Protection Components:.....	96
4.5.3 Mechanical Components:.....	97
4.5.4 Electrical Components.....	97
4.6 Ground Combat Environment.....	97
4.7 Naval Aircraft Environment	98
4.8 References	98
4.8.1 Standards and Specifications Resources.....	98
4.8.2 Supporting Resources	101
5. Information Transfer	103
5.1 Overview	103
5.1.1 Operational Environment Considerations.....	104
5.1.2 Adopted Network Definition.....	105
5.1.3 Performance Issues.....	106
5.2 Physical and Data Link Layers	109
5.2.1 Local and Metropolitan Area Network Physical and Data Link Layer Technologies.....	109
5.2.2 Wide and Metropolitan Area Network Physical and Data Link Layer Technologies.....	121
5.2.3 Radio Communications to Dispersed Forces	124
5.3 Internetwork Protocols	133
5.3.1 ATM	134
5.3.2 Network Layer	135
5.3.3 Transport Layer	137
5.4 Routing and Mobility Protocols.....	138
5.4.1 Routing	139
5.4.2 Mobile Addressing	141
5.5 Quality-of-Service.....	142
5.5.1 Description.....	142
5.5.2 State	143
5.6 References	144
5.6.1 Standards and Specifications Resources	144

5.6.2 Supporting Resources	148
6. Information Distribution.....	149
6.1 Overview	149
6.2 Concept of Operations for BNIDS.....	152
6.2.1 Official Individual Accounts.....	152
6.2.2 Command/Staff Accounts	153
6.2.3 Duty/Watch Accounts.....	154
6.2.4 Command Correspondence and Distribution Lists.....	154
6.2.5 Directory Services	155
6.2.6 Defense Message System (DMS) Interoperability	156
6.2.7 Security Certificate and Login Services	159
6.2.8 Web Drop and Pickup Service	159
6.2.9 BNIDS CONOPS Summary	159
6.3 Domain Name and Directory Services.....	160
6.3.1 Domain Name Service (DNS).....	160
6.3.2 Directory Service.....	162
6.4 Public Key Infrastructure (PKI).....	164
6.5 Electronic Messaging and Attachments	165
6.5.1 Implementation Guidance	167
6.5.2 Selection of an E-mail System	167
6.5.3 E-mail System Implementation	168
6.5.4 Interoperability with Other E-mail Systems.....	168
6.5.5 Individual's Official E-mail Address.....	169
6.5.6 Display Name.....	169
6.6 Network Utility Services	169
6.6.1 Network Time Service	169
6.6.2 System Management Services.....	171
6.6.3 Remote Access Services	172
6.6.4 File Transfer Services	172
6.6.5 Electronic Dialog.....	174
6.7 Web Services	174
6.7.1 Web Servers	174
6.7.2 Web Browsers	175
6.7.3 Web Utilities	181
6.7.4 Data Search and Retrieval.....	182
6.7.5 Data Push	184
6.8 Network News Service.....	186
6.9 References	187
6.9.1 Standards and Specifications Resources	187

7. Computing Resources	189
7.1 Overview	189
7.1.1 Background.....	189
7.1.2 Scope of Computing Resources	190
7.1.3 General Philosophy	190
7.2 Computing Hardware	193
7.2.1 Component Technologies	193
7.2.2 System Configurations.....	201
7.3 Operating System Services.....	208
7.3.1 Operating Systems.....	208
7.3.2 Application Programming Interface	219
7.3.3 Human Computer Interface.....	220
7.4 Operating Considerations	223
7.4.1 Security	223
7.5 Communications	223
7.5.1 Real Time.....	224
7.5.2 High Availability.....	224
7.6 References	225
7.6.1 Standards and Specifications Resources.....	225
7.6.2 Supporting Resources	229
8. Information Management	231
8.1 DOD Policy	233
8.1.1 Information Interoperability.....	233
8.1.2 Information Management.....	233
8.1.3 Data Administration	234
8.2 Information Architecture	235
8.3 Information Interchange	238
8.3.1 Push versus Pull	238
8.3.2 Information Discipline.....	240
8.3.3 Data Interchange Services.....	242
8.3.4 Messages.....	256
8.4 Database Management	258
8.4.1 Database Management Process	258
8.4.2 Database Interoperability	261
8.4.3 Database Documentation	265
8.4.4 Database Management Systems	266
8.5 Data Quality and Interoperability Metrics.....	273
8.5.1 Data Quality versus Information Quality.....	273

8.5.2 Data Interoperability.....	273
8.5.3 Database Assessment Areas.....	274
8.5.4 Selecting Performance Metrics	274
8.6 Information Engineering Tools.....	276
8.6.1 Process Modeling Tools.....	276
8.6.2 Data Modeling Tools	277
8.6.3 Information Transfer Management Tools	277
8.6.4 Architecture Management Tools	277
8.6.5 GOTS Information Tool Descriptions	278
8.7 References	281
9. Applications.....	285
9.1 Overview	285
9.1.1 Background.....	285
9.1.2 Defense Information Infrastructure Common Operating Environment (DII COE)287	
9.1.3 Beyond Software	288
9.1.4 Outline	288
9.2 Common Support Applications	289
9.2.1 Office Automation.....	289
9.2.2 Multimedia Information Processing	290
9.2.3 Interpersonal Communications	291
9.2.4 Environment Management.....	292
9.2.5 Database Utilities	293
9.2.6 Graphics and Imaging.....	293
9.2.7 Engineering Support.....	295
9.3 Cooperative Work Applications	295
9.3.1 Electronic Forms	298
9.3.2 Workflow Management	298
9.3.3 Conferencing	299
9.3.4 Calendaring and Scheduling Systems.....	300
9.3.5 Group Decision Support Systems.....	300
9.4 Computer Telephony.....	300
9.4.1 Computer Telephony Integration (CTI).....	301
9.5 Video Teleconferencing	302
9.5.1 Afloat Video Teleconference Systems	302
9.5.2 Shore Video Teleconference Systems	303
9.5.3 Security	305
9.5.4 Video Networks and Services	306
9.5.5 Video Recommended Standards Summary.....	307

9.6 Mission Area Applications	310
9.7 Application Support Services	311
9.7.1 General Software Engineering Services	311
9.7.2 Web Development.....	311
9.8 References	313
10. Enterprise Management	319
10.1 Introduction	319
10.2 Organizing for Enterprise Management.....	321
10.2.1 Enterprise Management	321
10.2.2 Concept of Operations	326
10.3 System Monitoring and Control Standards Guidance.....	329
10.3.1 The X.700 Series and XSM	331
10.3.2 Industry Specifications	333
10.4 System Quality	337
10.4.1 System Quality Concept	338
10.4.2 System Effectiveness.....	340
10.4.3 System Efficiency.....	347
10.4.4 System Characteristics.....	351
10.4.5 System Behavior	355
10.4.6 Selection of Performance Metrics	358
10.5 References	358